

## **AMENDMENTS TO THE CLAIMS**

### **Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Canceled)
2. (Canceled)
3. (Canceled)
4. (Canceled)
5. (Canceled)
6. (Currently Amended) A method for sending a message, said method comprising the steps of:
  - a) generating by a sender a password P;
  - b) sending the password P to a message recipient over a first channel;
  - c) generating authentication information by the sender for server authentication of the message recipient, wherein the authentication information is dependent on knowing the password P;
  - d) generating by the sender a random number as an initialization vector IV4;
  - e) generating by the sender a private key PK as  $H(IV4 \parallel P)$ , where P is a password known to a message recipient, H( ) is an agreed upon hashing algorithm and (  $\parallel$  ) is a message concatenation;
  - f) generating by the sender an encryption  $ENC = E(M \parallel H(M), PK)$ , where E is a predetermined symmetric key encryption algorithm, M is the message;
  - g) sending the authentication information and (IV4, ENC) from the sender to the server over a second channel;
  - h) authenticating the message recipient over a third channel using the authentication information to verify that the message recipient knows the password P; wherein the authentication information comprises:

- h-1) the authentication response AR as  $E(\text{ACNST2}, \text{ARK})$  generated by the message recipient, where ACNST2 is a predetermined constant;
  - h-2) the authentication response key ARK as  $H(\text{IV2} \mid \text{IV3} \mid \text{AS})$ , where IV2 is a second random number (as a second initialization vector) generated by the server and IV3 is a third random number (as a third initialization vector) generated by the message recipient;
  - h~3) the authentication string AS is as  $E(\text{ACNST1}, \text{PKAK})$ , where ACNST1 is a predetermined constant and E is a predetermined symmetric key encryption algorithm and AK is an authentication key derived from the password P.
- i) sending ENC from the server to the message recipient over the third channel only when the message recipient has been authenticated by the server.
7. (Original) A method as described in claim 6 comprising the further step of receiving authentication of said message recipient prior to sending (IV4, ENC).
8. (Currently Amended) A method as described in claim 6 wherein step c) further comprises the steps of:
- i) generating by the sender a first random number as a first initialization vector IV1;
  - ii) generating by the sender  $H(\text{IV1} \mid \text{P})$  as an authentication key AK;
  - iii) generating by the sender an authentication string AS as  $E(\text{ACNST1}, \text{AK})$ , where ACNST1 is a predetermined constant and E is a predetermined symmetric key encryption algorithm;
- and wherein step g) further comprises the steps of sending IV1 and AS to the server over the second channel:
- and wherein step h) further comprises the steps of:
- iv) sending from the server said vectors IV1 and IV2 to said message recipient over the third channel;
  - v) regenerating by said message recipient the authentication key AK;
  - vi) regenerating by said message recipient the authentication string AS;

- vii) sending from said message recipient to the server IV3 and AR;
- vii) regenerating by the server the authentication response key ARK as  $H(IV2 \parallel V3 \parallel AS)$ ;
- ix) computing by the server a decryption  $D(AR, ARK)$ , where D is a symmetric decryption algorithm corresponding to E; and
- x) authenticating said message recipient only if  $D(AR, ARK) = ACNST2$ , where ACNST2 is a second predetermined constant;  
and wherein step i) comprises the steps of:
  - xi) generating  $D(ENC, PK) = (M \parallel H(M))$ , where D is a symmetric key decryption algorithm corresponding to E;
  - xii) calculating  $H(M)$  from said value of M generated in step c; and
  - xiii) accepting said generated value of M only if said calculated value of  $H(M)$  equals said value of  $H(M)$  generated in step c).

9. (Canceled)

10. (Original) A method as described in claim 6 where H is an encryption algorithm defined hash algorithm using said encryption algorithm E.

11. (Original) A method as described in claim 10 where said encryption algorithm is expressed in less than 1000 bytes of code; whereby software comprising said algorithm can be quickly downloaded to a user's system.

12. (Original) A method as described in claim 11 where said encryption algorithm is an RC4 algorithm.

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)
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35. (Canceled)
36. (Canceled)
37. (Previously Presented) A system for sending a message, said system comprising:
  - a) means for generating by a sender a password P;
  - b) means for sending the password P to a message recipient over a first channel;

- c) means for generating authentication information by the sender for server authentication of the message recipient, wherein the authentication information is dependent on knowing the password P;
- d) means for generating by the sender a random number as an initialization vector IV4;
- e) means for generating by the sender a private key PK as  $H(IV4 | P)$ , where P is a password known to a message recipient, H( ) is an agreed upon hashing algorithm and (A|B) is a message concatenation;
- f) means for generating by the sender an encryption  $ENC = E(M | H(M), PK)$ , where E is a predetermined symmetric key encryption algorithm, M is the message;
- g) means for sending the authentication information and (IV4, ENC) from the sender to the server over a second channel;
- h) means for authenticating the message recipient over a third channel using the authentication information to verify that the message recipient knows the password P; wherein the authentication information comprises:
  - h-1) the authentication response AR as  $E(ACNST2, ARK)$  generated by the message recipient, where ACNST2 is a predetermined constant;
  - h-2) the authentication response key ARK as  $H(IV2 | IV3 | AS)$ , where IV2 is a second random number (as a second initialization vector) generated by the server and IV3 is a third random number (as a third initialization vector) generated by the message recipient;
  - h-3) the authentication string AS is as  $E(ACNST1, PKAK)$ , where ACNST1 is a predetermined constant and E is a predetermined symmetric key encryption algorithm and AK is an authentication key derived from the password P.
- i) means for sending ENC from the server to the message recipient over the third channel only when the message recipient has been authenticated by the server.